

NonLinear Parallel OPTimization Tool, Phase I

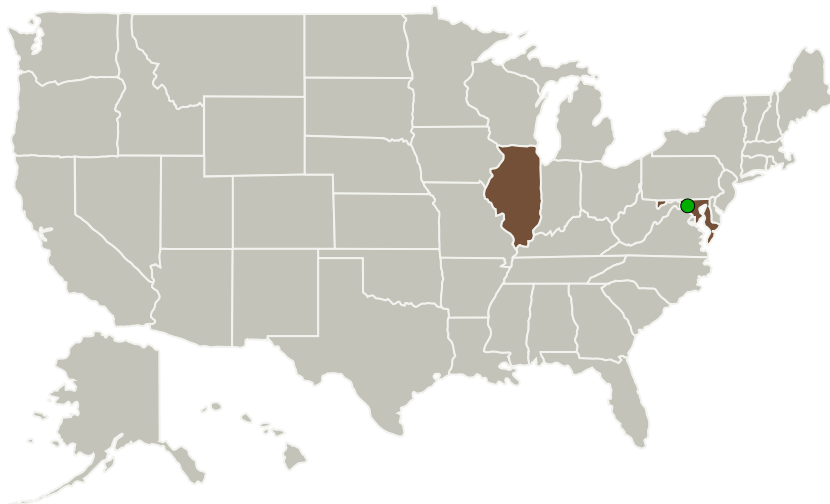
Completed Technology Project (2016 - 2016)



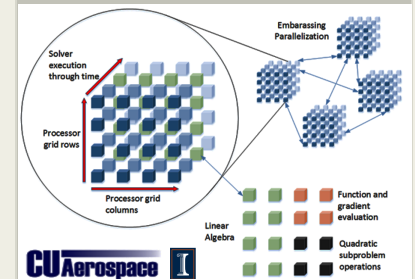
Project Introduction

CU Aerospace, in partnership with the University of Illinois propose the further development of a new sparse nonlinear programming architecture that exploits parallelism at three levels. The Nonlinear Parallel Optimization Tool (NLPAROPT) is a black-box NLP solver intended to take advantage of multicore processors and distributed processing super computers alike to vastly improve the time-to-solution for optimization problems. It has been built with NASA trajectory optimization problems in mind, but can be applied to any class of NLP problem. By parallelising not only the basic linear algebra, but also the derivative calculation, problem formulation, and sparse aspects of typical problems, significant speed improvements are achievable by comparison to existing open source and commercial NLP solvers.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
CU Aerospace, LLC	Lead Organization	Industry	Champaign, Illinois
 Goddard Space Flight Center (GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland



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Primary U.S. Work Locations

Illinois

Maryland

Project Transitions

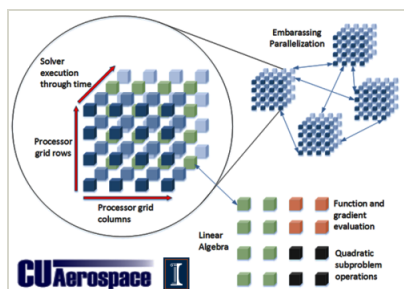
June 2016: Project Start

December 2016: Closed out

Closeout Documentation:

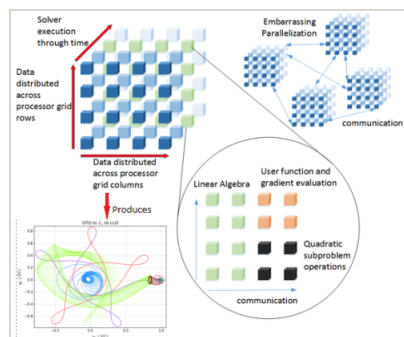
- Final Summary Chart(<https://techport.nasa.gov/file/139865>)

Images



Briefing Chart Image

NonLinear Parallel OPTimization Tool, Phase I
(<https://techport.nasa.gov/image/126908>)



Final Summary Chart Image

NonLinear Parallel OPTimization Tool, Phase I Project Image
(<https://techport.nasa.gov/image/131468>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

CU Aerospace, LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

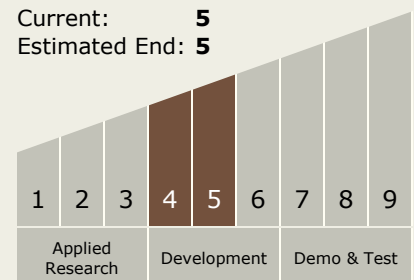
Carlos Torrez

Principal Investigator:

Alexander R Ghosh

Technology Maturity (TRL)

Start: **4**
Current: **5**
Estimated End: **5**



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Technology Areas

Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
 - └ TX05.4 Network Provided Position, Navigation, and Timing
 - └ TX05.4.2 Revolutionary Position, Navigation, and Timing Technologies

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System